Your MT-RNR1 Genetic Test Results and What They Mean

MT-RNR1: Uncertain Risk for Aminoglycoside Induced Hearing Loss

Pharmacogenomic Testing Overview

Pharmacogenomic (PGx) testing looks at how your genes affect your response to certain medications. Genes are pieces of DNA that provide instructions to make our bodies look and work as they do. Some genes affect the way medications work in the body. When comparing a group of people, there can be slight differences in the structure of each person's genes. These differences can affect how people respond to medications.

Some gene differences might make it harder for the body to get rid of some medications. This means that the usual dose of the medication may cause unexpected side effects. Some gene differences can cause the body to use up a medication too fast. This means that normal doses will not work as well, and the person may need higher doses. Some gene differences will not let certain medications work in the body at all. This means a different medication may work better. Some gene differences increase your chances of side effects to medications. This means that you may need to avoid certain medications.

About the MT-RNR1 Gene

The test we did was for a gene called the Mitochondrially encoded 12S ribosomal RNA (abbreviated MT-RNR1). Variations in the MT-RNR1 gene can impact our risk of side effects to certain antibiotic medications, specifically the class called aminoglycosides. Aminoglycosides are used to treat or prevent infections. Aminoglycosides can cause hearing loss in anyone if they are exposed to very high doses for prolonged periods of time. However, some patients are at high risk of hearing loss when exposed to only small amounts of aminoglycosides due to genetic variations in the MT-RNR1 gene. Depending on these genetic variations, people are considered to be at Normal, Increased, or Uncertain Risk for Aminoglycoside Induced Hearing Loss. It is also important to note that hearing loss can occur by several different mechanisms and genetics is not the only factor.

Your MT-RNR1 result puts you in the uncertain risk for aminoglycoside induced hearing loss group. Certain genetic variants in the MT-RNR1 gene are rare and we currently do not know how all variants affect a person's risk of hearing loss when treated with aminoglycoside

antibiotics. In the future as more research is done, we may be able to assign you to the normal or increased risk for aminoglycoside induced hearing loss groups. Your healthcare provider can look at several clinical factors before deciding what antibiotic medications to use.

The following medications interact with MT-RNR1:

Aminoglycoside antibiotics (used to treat or prevent several different infections): amikacin, dibekacin, gentamicin, kanamycin, neomycin, netilmicin, paromycin, plazomicin, streptomycin, tobramycin

Do not make any adjustments to your medications without first speaking to your healthcare provider.

Because your genes stay the same even as you age, it is important for you to share this result with your other doctors and pharmacists outside Children's Mercy. This result may affect how doctors prescribe medications throughout your life.

More Information

- Research continues to be done on what medications are affected by genetic test results. For more details about the MT-RNR1, please go to www.clinpgx.org.
- If you have questions about your pharmacogenetic test results or specific treatment options, discuss them with your healthcare provider or call 816-601-3360 to schedule an appointment at the Children's Mercy GOLDILOKs Clinic.
- If interested in volunteering for pharmacogenetic research, please contact the Children's Mercy Research Institute at pharmacogeneticsresearch@cmh.edu.

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